SL-MOD-GW
Modbus/TCP Gateway

User manual

Weidmüller

SL-MOD-GW
Modbus/TCP Gateway: User manual

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Important user information

This manual explains how to install, operate and configure a *SL-MOD-GW*. This device may only be used for the applications described in this document.

This manual is to be used with a *SL-MOD-GW* with firmware version 1.6.

These instructions are intended for use by trained specialists in electrical installation and control and automation engineering, who are familiar with the applicable national standards and safety procedures.

Safety Precautions

ELECTRICAL HAZARD

- This equipment must be installed and serviced only by qualified personnel. Such work should be performed only after reading this entire set of instructions.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Apply appropriate personal protective equipment and follow safe electrical practices.
- Turn off all power supplying the equipment in which the *SL-MOD-GW* is to be installed before installing, wiring or removing the *SL-MOD-GW*.
- Always use a properly rated voltage sensing device to confirm that power is off.
- The successful operation of this equipment depends upon proper handling, installation, and operation. Neglecting fundamental installation requirements may lead to personal injury as well as damage to electrical equipment or other property.

Failure to follow these instructions could result in death or serious injury!

Document conventions

Throughout this manual we use the following symbols and typefaces to make you aware of safety or other important considerations:

	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation that, if not avoided, could result in damage to equipment.
	Indicates information that is critical for successful application and understanding of the product.
	Provides other helpful user information that does not fall in above categories.
	Provides supplemental user information.
Acronym	This typeface is used to introduce acronyms or product names.
`Command`	This typeface is used to represent commands, prompts, input fields and filenames. In the context of programming it is used for functions, variable names, constants or class names.
`Placeholder`	This typeface is used to represent replacable text. Replaceable text is a placeholder for data you have to provide, like filenames or command line arguments.
`User input`	This typeface is used to represent data entered by the user or buttons.
`Screen output`	Screen output or program listing

1. Introduction

The *SL-MOD-GW* is a Modbus/TCP to Modbus RTU gateway.

The gateway features one serial port which can be configured as either RS-232, RS-485 or RS-422 and an Ethernet port. It can be mounted on a DIN rail.

Usage and configuration of the gateway is simple and conveniently performed using a web browser which connects to the embedded web server.

Possible areas of application are:

- PLC connection
- Operator panel interfacing
- HMIs
- SCADA integration
- Remote control & monitoring
- Data logging

1.1 Features

The *SL-MOD-GW* gateway provides the following key features:

- Modbus/TCP protocol (Ethernet)
- Modbus RTU protocol (either RS-232, RS-485 or RS-422, software configurable)
- Embedded web server for easy configuration and commissioning using a web browser
- Firmware upgradeable via Ethernet
- DIN rail mountable
- 24 V DC (10-30 V) power supply
- Status LEDs for power, Ethernet link, device status and communication status

1.2 Quick start checklist

- Read this set of instructions properly and in its entirety.
- Mount the unit.
- Connect the power. Do not connect yet serial ports.
- Configure the Ethernet communications settings with a web browser (using an Ethernet crossover cable) or with a terminal program like *HyperTerminal* (using a null modem cable)
- Configure the serial line communication settings.
- Configure the operational aspects of the device.
- Wire serial line interfaces.

2. Description

The power and RS-485/RS-422 terminals are placed on the top side of the unit. The RS-232 and Ethernet connectors are placed on the bottom side of the unit as shown in the following illustration:

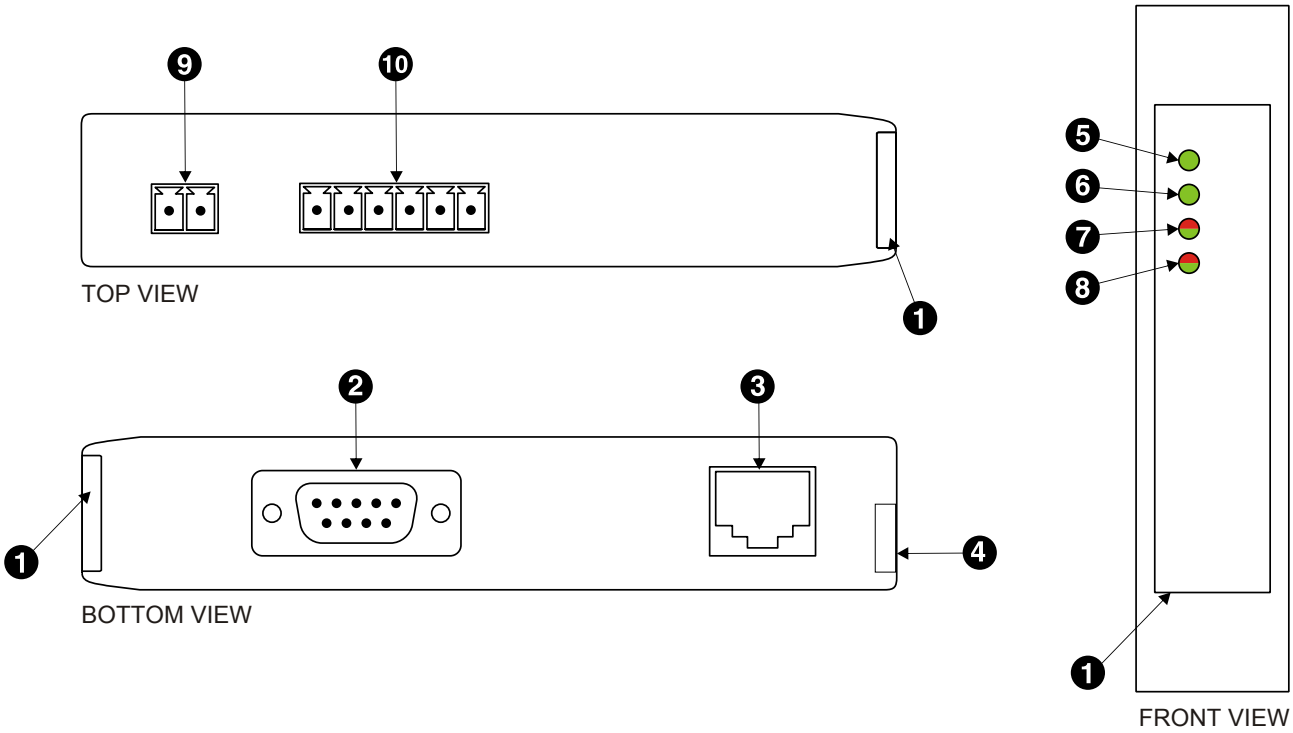


Illustration 2.1: Location of connectors

❶ Clear front cover
❷ RS-232 connector
❸ Ethernet connector
❹ DIN rail clip
❺ Power LED
❻ Ethernet link LED
❼ Device status LED
❽ Communication status LED
❾ Power terminals
❿ RS-485/RS-422 terminals

2.1 LED indicators

Four LEDs located at the front panel indicate the status of the device. The LEDs assist maintenance personnel in quickly identifying wiring or communication errors.

A LED test is exercised at power-up, cycling each LED off, green and then red for approximately 0.25 seconds. At the same time the power-on self test of the device is performed.

The following table outlines the indicator condition and the corresponding status after the power-on self test has been completed:

LED	Function	Condition	Indication
Power	Power	Off	No power applied to the device.
		Green	Power supply OK
Link	Ethernet link	Off	No Ethernet link
		Green	Ethernet link OK
Status1	Device status	Off	The device has an unrecoverable fault; may need replacing.
		Flashing green 1 s rate	Device operational but needs commissioning due to configuration missing, incomplete or incorrect.
		Green	The device is operating in normal condition.
		Flashing red 1 s rate	Device operational but has a fault listed which requires acknowledgment.
		Red	The device has an unrecoverable fault; may need replacing. Flashing sequence and rate of Status2 LED indicates fault class.
Status2	Communication status	Off	No Modbus/TCP connection.
		Green	Modbus/TCP connection established.

Table 2.1: LED diagnostic codes

3. Installation

3.1 Regulatory notes

1. The *SL-MOD-GW* is suitable for use in non-hazardous locations only.
2. The *SL-MOD-GW* is not authorized for use in life support devices or systems.
3. Wiring and installation must be in accordance with applicable electrical codes in accordance with the authority having jurisdiction.
4. This is a Class A device and intended for commercial or industrial use. This equipment may cause radio interference if used in a residential area; in this case it is the operator's responsibility to take appropriate measures.
5. The precondition for compliance with EMC limit values is strict adherence to the guidelines specified in this set of instructions. This applies in particular to the area of grounding and shielding of cables.

FCC Notice (USA only)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Notice (Canada only)

This Class A digital apparatus complies with Canadian ICES-003.

3.2 Unpacking, handling and storage

1. Please read this set of instructions. carefully before fitting it into your system.
2. Keep all original packaging material for future storage or warranty shipments of the unit.
3. Do not exceed the specified temperatures.

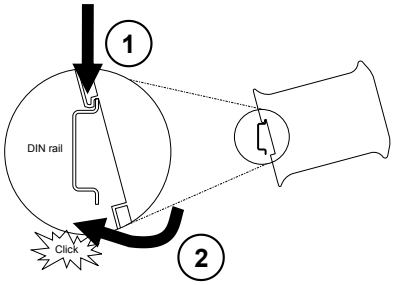
3.3 Before connecting anything

1. Before installing or removing the unit or any connector, ensure that the system power and external supplies have been turned off.
2. Check the system supply voltage with a multimeter for correct voltage range and polarity.
3. Connect the power supply cable and switch on the system power. Check if the Power LED is lit.
4. Turn off system power.
5. Connect all I/O cables.

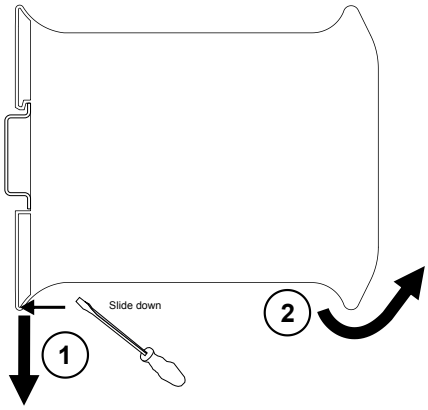
6. Once you are certain that all connections have been made properly, restore the power.

3.4 DIN rail mounting and removal

The *SL-MOD-GW* gateway is designed to be mounted on a 35 mm DIN rail according to DIN/EN 50022. The enclosure features a 35 mm profile at the back which snaps into the DIN rail. No tools are required for mounting. Please observe the rules outlined in Section 3.5, “Mounting rules”.



To mount the unit on a DIN rail, slot the top part of the *SL-MOD-GW* into the upper guide of the rail and lower the enclosure until the bottom of the red hook clicks into place.



To remove the *SL-MOD-GW* from the DIN rail, use a screw driver as a lever by inserting it in the small slot of the red hook and push the red hook downwards. Then remove the unit from the rail by raising the bottom front edge of the enclosure.

3.5 Mounting rules

The enclosure provides protection against solid objects according to IP 20 / NEMA Type 1 protection rating. When mounting the unit observe the following rules:

- No water splash and water drops
- No aggressive gas, steam or liquids
- Avoid dusty environments.
- Avoid shock or vibration
- Do not exceed the specified operational temperatures and humidity range.
- Mount inside an electrical switchboard or control cabinet.
- Make sure there is sufficient air ventilation and clearance to other devices mounted next to the unit.
- Observe applicable local regulations like EN60204 / VDE0113.

3.6 Powering the SL-MOD-GW

Before connecting power please follow the rules in the section called “Safety Precautions” and Section 3.3, “Before connecting anything”.

Power is supplied via a 3.81 mm 2-pin pluggable terminal block located at the top side of the mounted unit (refer to Figure 2.1, “Location of connectors”). The following table and picture shows the power terminal socket pinout:

Pin	Signal	Function
1	V+	Positive voltage supply (10 - 30 V DC)
2	V-	Negative voltage supply, DC power return

Table 3.1: Power supply connector pinout

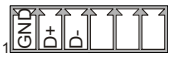
Caution

Make sure that the polarity of the supply voltage is correct before connecting any device to the serial ports! A wrong polarity can cause high currents on the ground plane between the V- power supply pin and the serial port ground pins, which can cause damage to the device.

3.7 Wiring the RS-485/422 interface

The RS-485/422 port is used for integrating the *SL-MOD-GW* into a two-wire or four-wire Modbus over Serial Line network. The use of either the RS-485 or RS-422 interface must be configured using the web interface (See Section 5.3.2, “Configuring serial line Modbus”). The *SL-MOD-GW* is a Modbus Master device on this interface.

The RS-485 and RS-422 signals are located at the 3.81 mm 6-pin pluggable terminal block on the top side of the mounted unit (refer to Figure 2.1, “Location of connectors”). The following table and picture shows the pinout:



RS-485

RS-422

Pin	RS-485 signal	RS-422 signal	Description
3	GND	GND	Modbus Common
4	D+	TX+	Modbus D1 or TXD1
5	D-	TX-	Modbus D0 or TXD0
6		GND	Modbus Common
7		RX+	Modbus RXD0
8		RX-	Modbus RXD1

Table 3.2: RS-485/RS-422 connector pinout

- Line termination is required and is typically done with a 120 Ohm 1/4 W resistor. For RS-485 operation the bus must be terminated at both ends. For RS-422 operation a termination resistor must be inserted between the RX+/RX- signals.
- Maximum number of RS-485 nodes without repeater is 32.

- Stub connections off the main line should be avoided if possible or at least be kept as short as possible. Stub connections must not have terminating resistors.
- Maximum cable length to 1200 m (4000 ft).
- To assure a high degree of electromagnetic compatibility and surge protection the cable should be twisted pairs and shielded. An additional cable conductor or pair may be used for the GND reference.

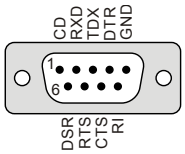
Caution

Do *not* connect the cable shield to the GND pins! Use an external chassis ground connection to terminate the shield.

3.8 Wiring the RS-232 interface

The RS-232 port can alternativly be used for serial communication to a Modbus Slave device instead of RS-485. The use of the RS-232 interface must be configured using the web interface (See Section 5.3.2, “Configuring serial line Modbus”). The *SL-MOD-GW* is a Modbus Master device on this interface.

The Modbus RS-232 connector is a male 9-pin D-sub type located at the bottom side of the mounted unit (refer to Figure 2.1, “Location of connectors”). It has industry standard EIA-574 data terminal equipment (DTE) pinout as shown in the following table and picture:



Pin	Signal	Function	Direction
1	DCD	(unused)	in
2	RXD	Receive data	in
3	TXD	Transmit data	out
4	DTR	(unused)	out
5	GND	Signal ground	
6	DSR	(unused)	in
7	RTS	(unused)	out
8	CTS	(unused)	in
9	RI	(unused)	in

Table 3.3: Modbus RS-232 connector pinout

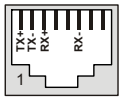
- Maximum cable length is 15 m (50 ft) or a length equal to a line capacitance of 2500 pF, both at the maximum standard bit rate of 20 kbps. If operating at higher bit rates the maximum cable length drops to 3 m (10 ft) at a bit rate of 57.6 kbps.
- To assure a high degree of electromagnetic compatibility and surge protection the RS-232 cable should shielded. The shield shall be connected to an external chassis ground at the either or both ends, depending on the application.
- The shield must *not* be connected to the GND pin.

Note

To connect the *SL-MOD-GW* to a PC (Personal Computer) or any other device with data terminal equipment (DTE) pinout you need a null-modem or cross-over cable.

3.9 Connecting Ethernet

The following table describes the 10BASE-T Ethernet RJ-45 connector pinout:



Pin	Signal	Function
1	TX+	Non-inverting transmit signal
2	TX-	Inverting transmit signal
3	RX+	Non-inverting receive signal
4		*Internal termination network*
5		*Internal termination network*
6	RX-	Inverting receive signal
7		*Internal termination network*
8		*Internal termination network*

Table 3.4: Ethernet connector pinout

- We recommend to use Category 5 UTP network cable.
- Maximum cable length is 100 m (3000 ft).

4. Ethernet & IP configuration

Before configuring the *SL-MOD-GW*, obtain a unique static IP address, subnet mask, and default gateway address from your network administrator.

The factory default IP address of the *SL-MOD-GW* is 192.168.1.130.

There are several methods of configuring the unit's IP address:

1. Via the Serial Port 1 and a terminal program like *HyperTerminal* (see Section 4.1, "IP setup using a terminal program like HyperTerminal").

2. Leaving your PC connected to your corporate network and temporarily changing the IP settings on your PC to match the subnet of the *SL-MOD-GW* (see Section 4.2, "Temporarily changing the IP settings on your PC").

Note

In order to connect to the *SL-MOD-GW* via TCP/IP, your PC must be on same IP subnet as the gateway. In most situations this means that the first three numbers of the IP address have to be identical.

4.1 IP setup using a terminal program like HyperTerminal

1. Connect a null modem RS-232 cable between your PC and the *SL-MOD-GW*'s Serial Port 1.

2. In Windows XP, click **`Start`**, point to **`All Programs`**, point to **`Accessories`**, point to **`Communications`**, and then click **`HyperTerminal`**.

3. When *HyperTerminal* starts, it opens a dialog box and asks for a name for the new connection. Enter a name (for example, `deviceconfig`) then click **`OK`**.

4. The `Connect to` dialog opens. Select the COM port you will be using in the `Connect using` drop-down list box, then click **`OK`**.

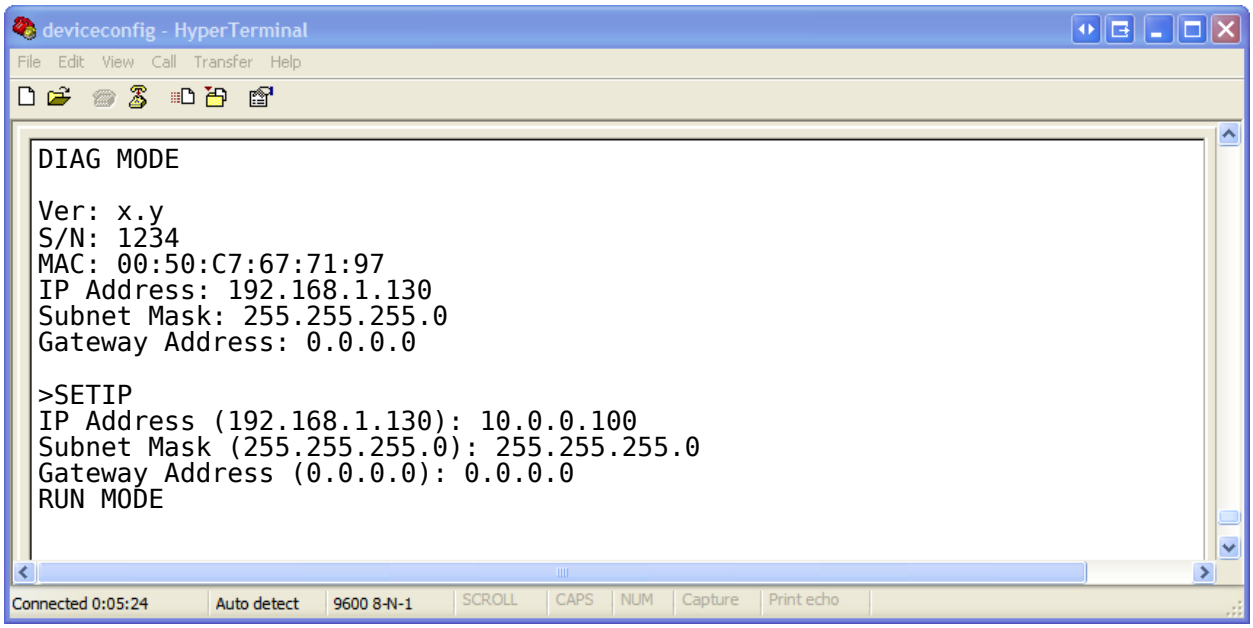
5. Select **`9600`**, **`8`**, **`None`**, **`1`**, **`None`** in the `COM Properties` dialog, then click **`OK`**.

6. *HyperTerminal* is now connected to the serial line.

7. Keep the **`space`** bar pressed in *HyperTerminal* and power-cycle your device at the same time.

8. A menu should appear after one or two seconds showing device information, the current IP configuration and a > prompt.

9. Type **SETIP**, then press **Enter** within 10 seconds after the prompt is shown:



10. The device will show current values and prompt for new values for IP address, net mask and gateway address. Enter the new values and press **Enter**. A key press must be received at least every 10 seconds otherwise the device will go back to *RUN MODE* and resume normal operation.

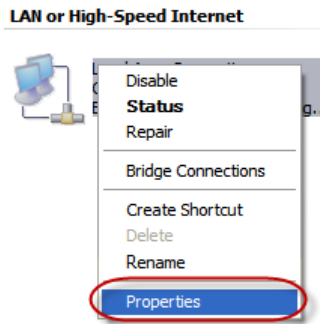
11. The gateway will return to the main prompt. Type **X** and press **Enter** to leave *DIAG MODE* and resume normal operation indicated with `RUN MODE`.

4.2 Temporarily changing the IP settings on your PC

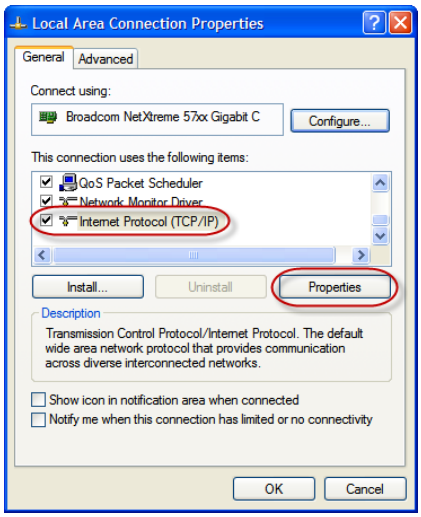
This method involves manually assigning an IP address to your PC in the same subnet as the gateway. The default subnet of the gateway is 192.168.1.0/8.

1. Connect the *SL-MOD-GW* to your Ethernet network.

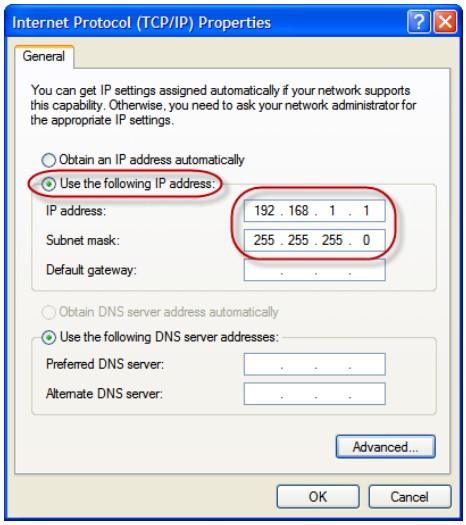
2. On a Windows PC, open the `Control Panel` and double-click on **Network Connections**. Right-click on the Network Connection associated with your network adapter and select **Properties**:



This will show the `Local Area Connection Properties` Dialog:



3. Select the **`Internet Protocol (TCP/IP)`** entry and click on **`Properties`** to open the TCP/IP Properties dialog as shown below:


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 1
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

4. Write down your current settings so they can be restored later.
5. Select **`Use the following IP address`** and configure a static IP address in the same subnet as the device, for example `192.168.1.1` and the subnet mask `255.255.255.0`. Click **`OK`** to save the changes.
6. Start *Internet Explorer*.
7. In the address box, type **`192.168.1.130`** and then press **`Enter`**.
8. Click **`Configuration…`** and then **`Ethernet & IP`** in the menu on the left side of the page.
9. Enter the IP address, subnet mask, and gateway address assigned to your *SL-MOD-GW*, then click **`Save`**.
10. Restore your computer's original settings.

5. Web browser based management

The *SL-MOD-GW* incorporates an embedded web server. This allows you to connect to the device and monitor and configure it using a web browser. Most browsers should work, provided they support JavaScript. We recommend *Internet Explorer* 6.0 or higher.

5.1 Connecting to the SL-MOD-GW

Once you made sure that your PC is configured to be on the same subnet as the *SL-MOD-GW*, start your web browser. In the address box, type the IP address of your device (192.168.1.130 is the default), and then press **`Enter`**. (See Chapter 4, *Ethernet & IP configuration*)

The web browser will establish communication with the embedded web server and an overview page similar to the following picture will appear:

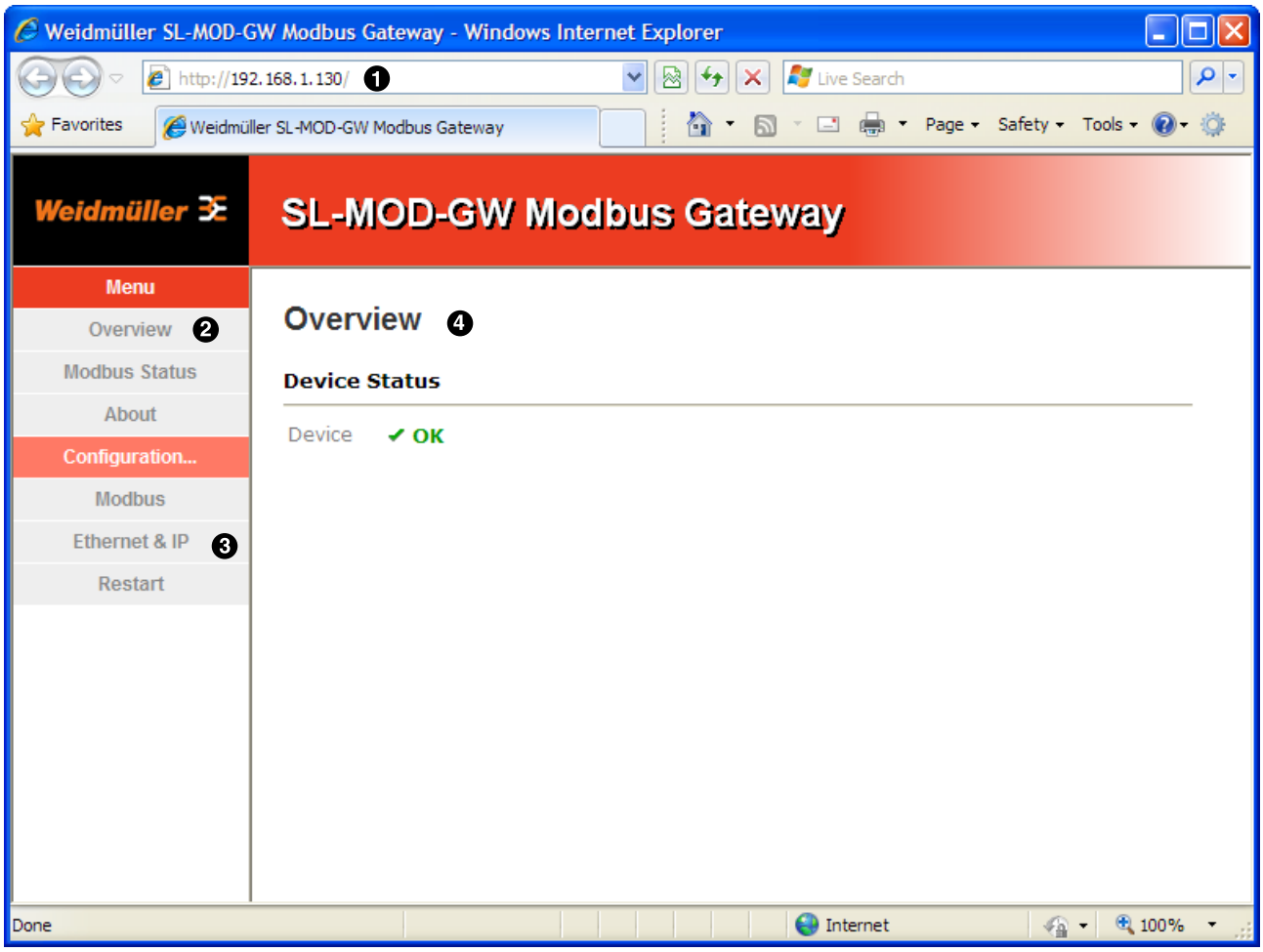


Illustration 5.1: Device management and configuration via the web browser

❶ Gateway IP address
❷ Main menu
❸ Configuration sub-menu
❹ Information area

Use the menu bar shown on the left side to navigate the different pages.

Note

In order to connect to the *SL-MOD-GW* via TCP/IP, your PC must be on same IP subnet as the gateway. In most situations this means that the first three numbers of the IP address have to be identical.

5.2 Monitoring and diagnostic

The *SL-MOD-GW* offers several web pages which allow monitoring of the status of the different communication networks and the device performance.

5.2.1 Device status

The `Overview` page shows the principal device status as shown in the following picture:

Illustration 5.2: Overview page

The value shown in the `Device` row represents the device status register which keeps track of run-time faults. All run-time faults are latched and must be reset by the user. The following faults can be listed here:

`OK`
The device is fault free.

`Watchdog reset`
This warning indicates that the device was reset by it's internal watchdog supervision circuit.

`Brown out reset`
This warning indicates that the device was reset by it's internal supply voltage monitoring circuit. This fault occurs when the supply voltage drops below the lower limit.

`Device out of memory`
This warning indicates that the internal dynamic memory has been exhausted and due to this a certain function could not be completed.

`Device configuration data write failure`
This alarm indicates that the configuration data could not be written to the non-volatile memory. Configuration data changes will be lost once the device is power-cycled or reset.

`Reset to factory defaults`
This alarm indicates that the device' configuration data was reset to factory defaults. The device requires re-commissioning.

5.2.2 Modbus connection status

The `Modbus Status` page shows status and statistics about the Modbus traffic. These values provide valuable information used to troubleshoot Modbus network problems. This page is automatically updated every 5 seconds.

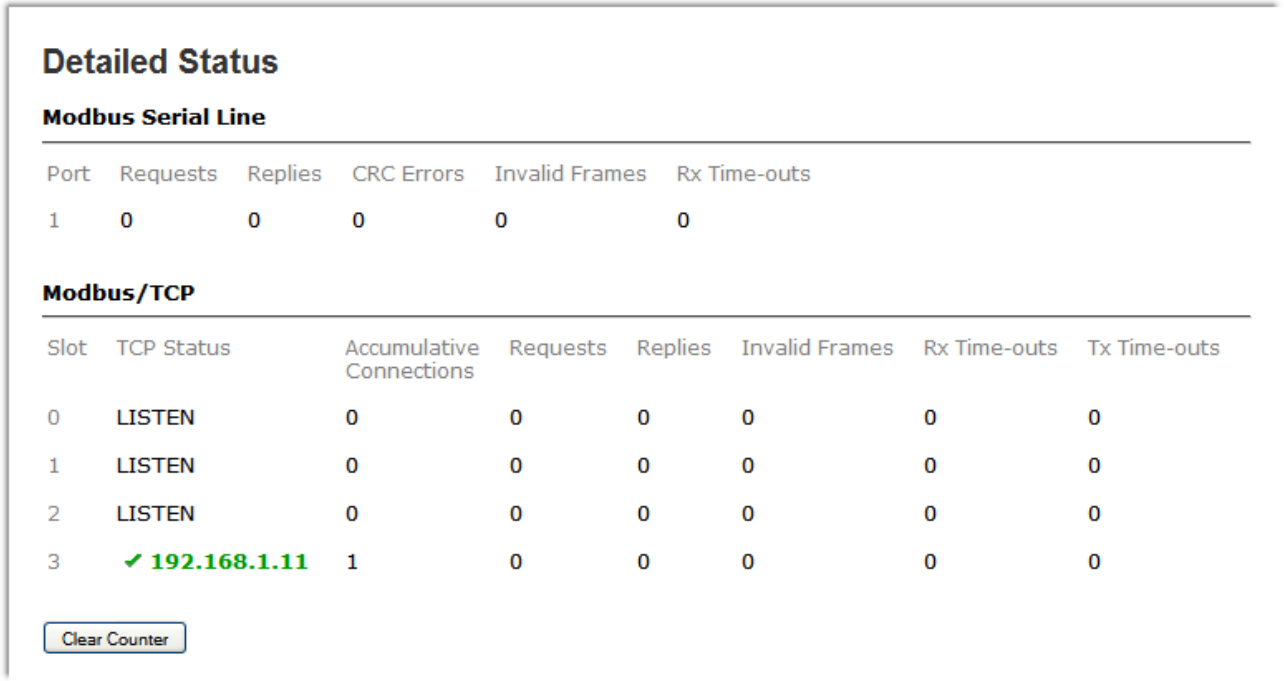

Detailed Status
Modbus Serial Line
Port Requests Replies CRC Errors Invalid Frames Rx Time-outs
1 0 0 0 0 0
Modbus/TCP
Slot TCP Status Accumulative Connections Requests Replies Invalid Frames Rx Time-outs Tx Time-outs
0 LISTEN 0 0 0 0 0 0
1 LISTEN 0 0 0 0 0 0
2 LISTEN 0 0 0 0 0 0
3 ✔ 192.168.1.11 1 0 0 0 0 0
Clear Counter

Illustration 5.3: Modbus status page

Note

This page shows accumulated readings since the *SL-MOD-GW* was last activated or reset. If power to the *SL-MOD-GW* is lost, all cumulative values are reset to zero.

The following statistics are maintained:

`TCP status`
Status of the TCP/IP connection as per TCP finite state machine (refer to RFC 793). If no client is connected the status indicates `LISTEN`. If a client is connected, it's IP address is shown.

`Accumulative connections`
A counter that increments each time a client opens a Modbus/TCP connection.

`Requests`
A counter that increments each time an inbound request message is successfully received.

`Replies`
A counter that is incremented each time a reply message is sent back to the master. This includes exception replies.

`CRC errors`
A counter that increments each time a message is received that has a CRC that does not match what is calculated. Typically the result of wiring issues. Messages with CRC errors are discarded and not replied to.

`Invalid frames`
A counter that increments each time a malformed Modbus frame is detected. Malformed frames are for example messages larger than the allowed maximum PDU size defined in the Modbus standards. This can be caused by non-Modbus traffic on the network.

`Rx time-outs` (Modbus serial line)
A counter that increments each time an inter-character time-out occurred during the reception of an inbound message.

`Rx time-outs` (Modbus/TCP)
A counter that increments if the master connection has timed out. Subsequently the connection is terminated by the *SL-MOD-GW*. A time-out occurs if no Modbus request is received from a connected client within a 10 second period.

`Tx time-outs`
Number time-outs occurred when attempting to send a reply message.

The cumulative diagnostic data is reset when the device is power cycled or reset. The data is also reset by pressing the **`Clear Counter`** button.

5.2.3 Finding the firmware version and serial number

Click on the **`About`** menu entry on the menu bar to show the product information as shown below:

Illustration 5.4: About page

This product information is important for service and support inquiries. The following product information is provided:

`Product name`
The name of the product.

`Hardware version`
SL-MOD-GW hardware version.

`Firmware version`
The firmware version that is installed on the *SL-MOD-GW*.

`Serial number`
The serial number of the *SL-MOD-GW*. The serial number is specific to your device.

5.3 Configuring and commissioning

The configuration pages are accessed by clicking on the `Configuration...` menu entry on the menu bar which then expands a configuration sub-menu. All configuration settings are kept in the device' non-volatile memory.

Note

If you make changes to any settings, remember to save each page before changing to a different page!

5.3.1 Configuring Ethernet and IP

Select the **`Configuration→Ethernet & IP`** sub-menu from the menu bar to open the `Ethernet and IP` settings which are shown below:

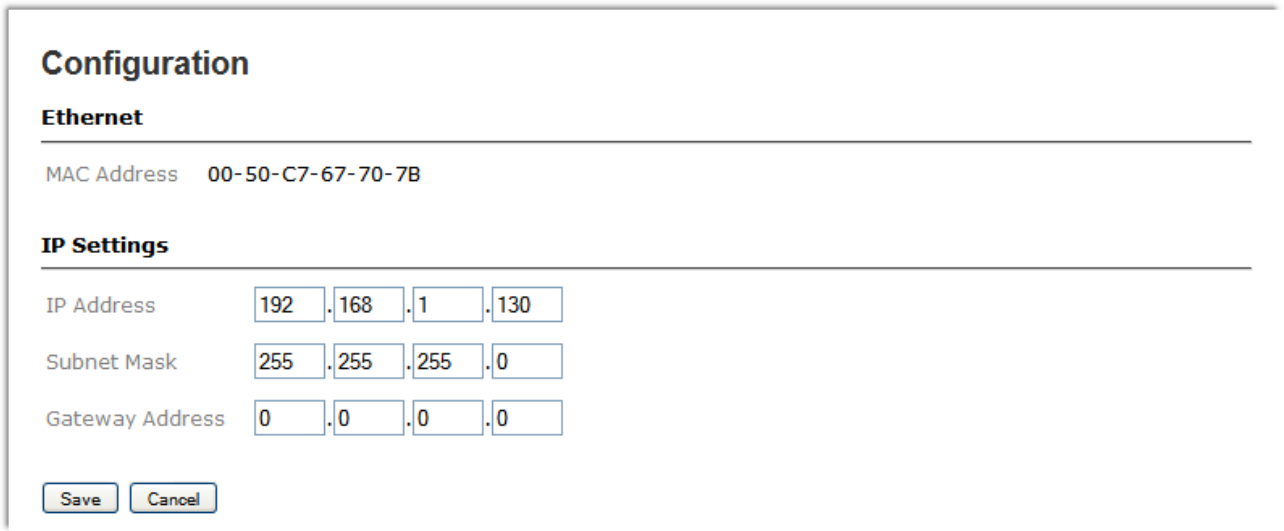

Configuration
Ethernet
MAC Address 00-50-C7-67-70-7B
IP Settings
IP Address 192 . 168 . 1 . 130
Subnet Mask 255 . 255 . 255 . 0
Gateway Address 0 . 0 . 0 . 0
Save
Cancel

Illustration 5.5: Ethernet and IP settings page

The following Ethernet parameters are shown:

`MAC address`
The device' unique MAC address. This number is hard coded and cannot be changed.

The following Internet protocol (IP) settings can be entered:

`IP address`
The IP address assigned to this device.

`Subnet mask` (also known as indexterm2:[network mask])
If you have a router, enter the subnet mask for the segment to which this device is attached.

`Gateway address`
If your network segment has a router, enter its IP address here. Otherwise leave the address as `0.0.0.0`.

Once you click **Save** the new settings are stored and applied instantly. The new settings are confirmed with the following page:

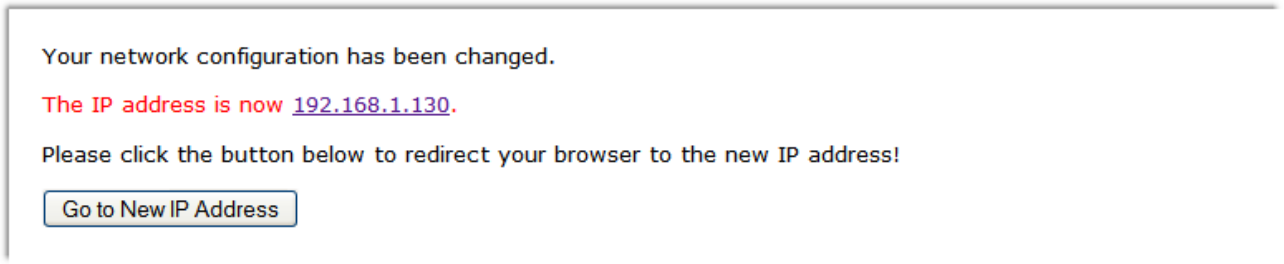

Your network configuration has been changed.
The IP address is now 192.168.1.130.
Please click the button below to redirect your browser to the new IP address!
Go to New IP Address

Illustration 5.6: IP settings changed confirmation

Important

Please write down the new IP address so you are able to communicate with the device in the future!

5.3.2 Configuring serial line Modbus

The Modbus settings for serial line can be configured to match the network configuration of your Modbus master device. Select the **Configuration→Modbus** sub-menu from the menu bar to open the Modbus settings which are shown below:

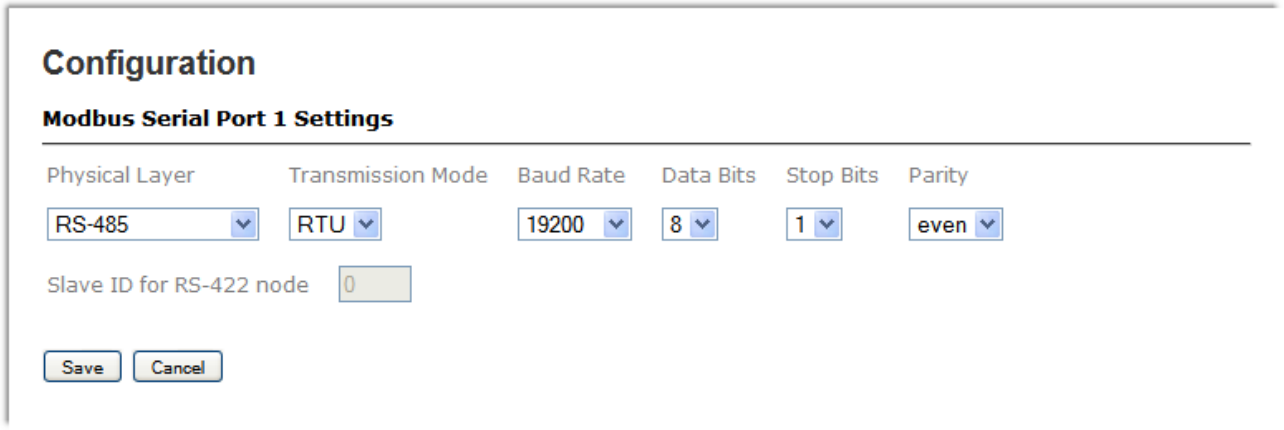


Illustration 5.7: Modbus settings page

The following Modbus settings can be entered:

`Physical layer`
: Can be set to two-wire RS-485, RS-422 or RS-232 mode. RS-485 is the default. Depending on this setting either the D-sub (RS-232) connector or the terminal block connector (RS-485/422) of the *SL-MOD-GW* is utilized. The (RS-485 + RS-422) mode is a special mode which allows operating one RS-422 device and a RS-485 bus one the same serial interface.

`Transmission mode`
: Only RTU mode can be selected here.

`Baud rate`
: 9600 and 19200 are the most common baud rates for Modbus. 19200 is the default setting.

`Data bits`
Only 8 data bits can be selected here which is a requirement for RTU.

`Stop bits`
Can be configured to be 1 or 2. The Modbus standard mandates that 2 stop bits are configured when using no parity.

`Parity`
Changes parity mode to either none, even or odd. The default parity mode for Modbus is even parity.

`Slave ID for RS-422 node`
This setting is only valid for the combined `RS-485 + RS-422` mode which allows operating one RS-422 device and a RS-485 bus one the same serial interface. This setting determines based on the slave ID whether a Modbus message is transmitted onto the RS-485 bus or the RS-422 interface. Configure here the slave ID of the RS-422 device.

Once you click **`Save`** the new settings are stored and applied instantly. A confirmation message is shown.

5.3.3 Remote restarting the device

You can perform a remote restart of the device from the web interface. A remote restart is similar to power cycling the device. Possibly connected clients are disconnected and communication is interrupted until the device has rebooted.

To perform a remote restart, click on the **`Configuration`** sub-menu and then click on the **`Restart`** menu entry. This will open the device restart page as shown below:

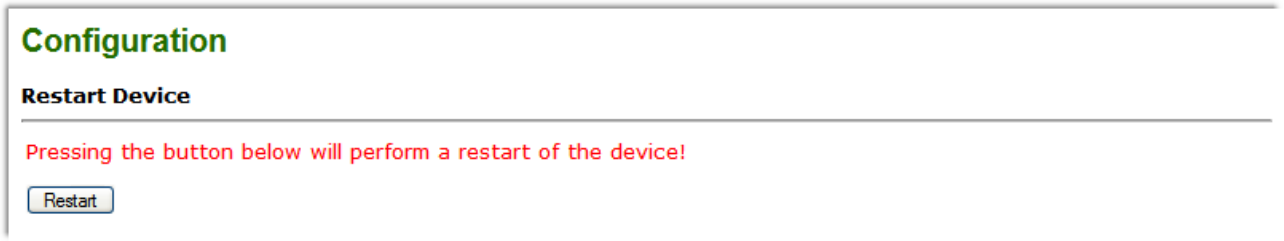


Illustration 5.8: Restart device page

Click on the **`Restart`** button to perform a restart of the device. The restart is confirmed with the following notification:

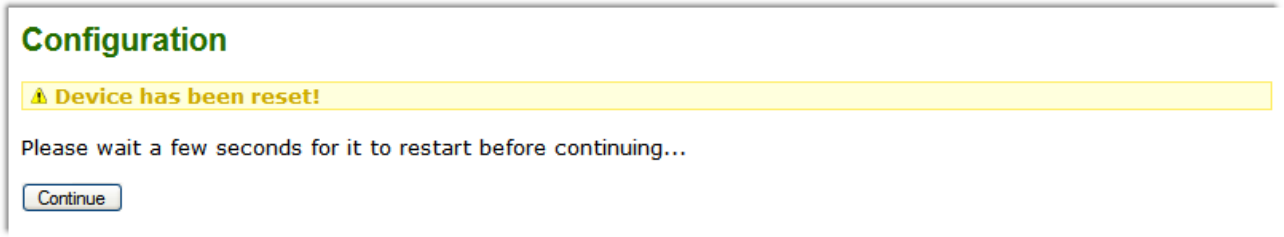


Illustration 5.9: Restart confirmation page

Please allow a few seconds before continuing working with the device as it has to fully start-up first, before being able to respond to further web browser requests.

Note

After a remote restart a *Watchdog reset* alarm is shown on the device' home page. This is a side-effect of the remote restart procedure and the alarm shall be ignored and cleared.

6. Decommissioning

Before disconnecting the unit please follow the rules in the section called “Safety Precautions”.

6.1 Disconnecting

1. Ensure that the system power and external supplies have been turned off.
2. Disconnect power supply plug.
3. Disconnect all I/O cables.
4. Remove the *SL-MOD-GW* from the DIN rail following the procedure described in Section 3.4, “DIN rail mounting and removal”.

6.2 Disposal

This product must be disposed of at a specialized electronic waste recycling facility. Do not dispose of in domestic waste.

Appendix A.Specifications

SL-MOD-GW Modbus/TCP Gateway

Interfaces	
Ethernet	1
Serial ports	1, software configurable as either 1 x RS-232 or 1 x RS-485 or 1 x RS-422
User interface	
LED indicators	Power (green), Ethernet link (green), 2 status (bi-color red/green)
Monitoring & configuration	Web browser based
Diagnostic	
High availability features	Watchdog supervision, brown-out detection
Serial Port 1 RS-232 interface	
Connector	male 9-pin D-sub, DTE, EIA-574 pin-out
Physical layer	EIA-232-F
Isolation	non-isolated
Signals	RXD, TXD, RTS, CTS, DTR, DSR, DCD, RI
Speed	300, 600, 1200, 2400, 4800, 9600, 19200, 57600, 115200 bps
Protocols	Modbus RTU master
Serial Port 1 RS-485/RS-422 interface	
Connector	3.81 mm 6-pin pluggable terminal block header
Physical layer	EIA-485-A, 2-wire or 4-wire
Isolation	non-isolated
Speed	300, 600, 1200, 2400, 4800, 9600, 19200, 57600, 115200 bps
Max. number of nodes	32
Protocols	Modbus RTU master
Ethernet port	
Connector	8-pin RJ-45 socket for Cat 5 UTP
Physical & Data Link Layer Layer	IEEE 802.3i 10BASE-T
Isolation	1.5 kV galvanic
Speed	10 Mbit/s
Max. cable length	100 m (328 ft)
Ethernet frame types	802.3
Protocols	Modbus/TCP slave, HTTP, IP, TCP, ARP
Concurrent connections	4 Modbus/TCP slave, 2 HTTP
Power supply	
Connector	3.81 mm 2-pin pluggable terminal block header
Voltage	10-30 V DC
Current	30 mA typical @ 24 V DC
Intrinsic consumption	750 mW
Electromagnetic compatibility	

Emissions (radiated and conducted)	AS/NZS CISPR 22 / EN 55022 (Class A)
Immunity	EN 55024
Electrostatic discharge	EN 61000-4-2
Radiated RF	EN 61000-4-3
Fast transients	EN 61000-4-4
Conducted RF	EN 61000-4-6
Enclosure	
Material	Self-extinguishing PC/ABS blend (UL 94-V0)
Mounting	35 mm DIN rail (EN 60715)
Classification / Type rating	IP 20 / NEMA Type 1
Cooling	Convection
Environmental	
Operating temperature	0 to 60 °C / 32 to 140 °F
Storage temperature	-25 to 85 °C / -13 to 185 °F
Humidity rating	10 to 95% relative humidity, non condensing
Operating ambience	Free from corrosive gas, minimal dust
Physical	
Dimensions	101 x 22.5 x 120 mm / 3.98 x 0.886 x 4.72 in
Weight	0.12 kg / 0.265 lb
Compliance	
Australia	C-Tick
Europe	CE, RoHS
USA	FCC Part 15 (Class A)
Canada	ICES-003 (Class A)

A.1 Dimensions

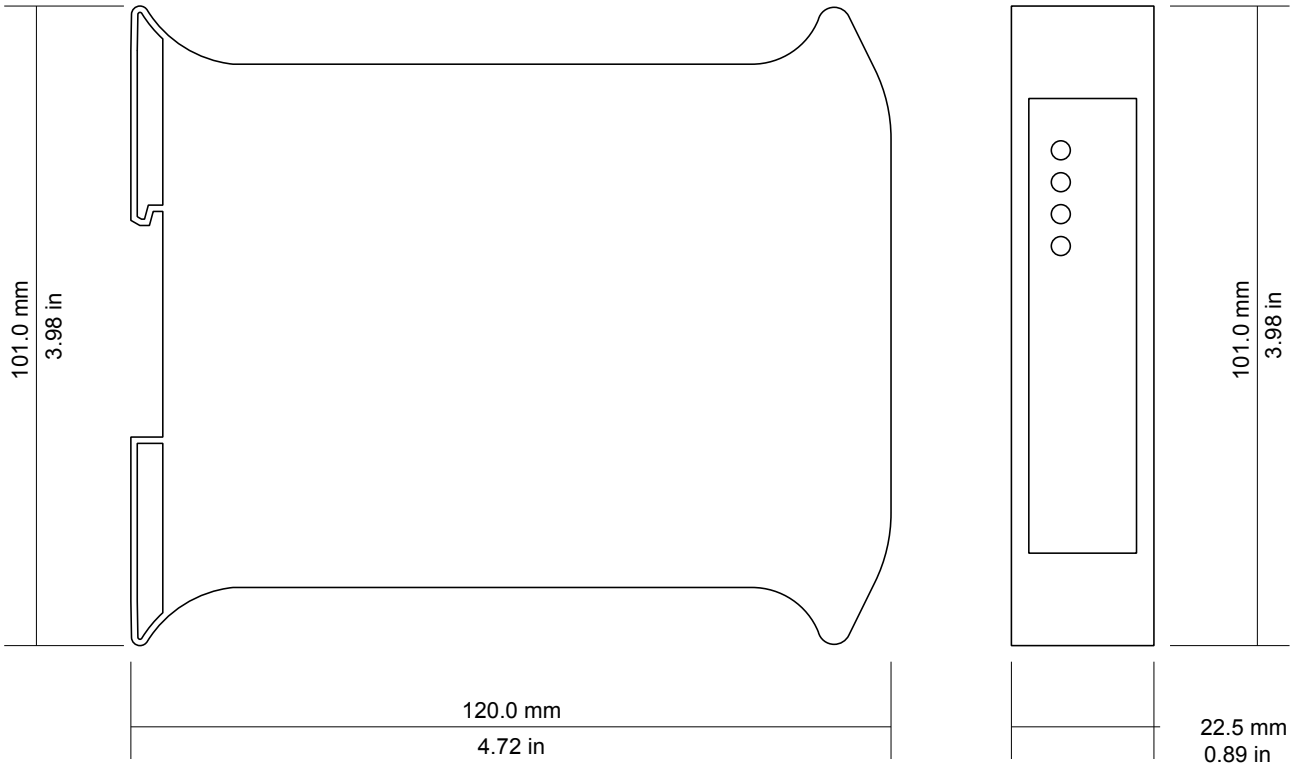


Illustration A.1: Enclosure dimensions

Glossary

10BASE-T
: 10 Mbit/s twisted pair Ethernet standard. Standardized in IEEE 802.3i

APIPA
: Automatic Private IP Addressing

Class A
: Class A equipment is that used in commercial or light industrial environments.

DCE
: Data communications equipment. DTE and DCE devices have different pinouts for RS-232 connectors. A Modem for example is a DCE.

DIN rail
: 35 mm wide mounting bracket standardized in DIN/EN 50022.

DTE
: Data terminal equipment. DTE and DCE devices have different pinouts for RS-232 connectors. A PC for example is a DTE.

EIA-232
: Standard for serial transmission of data between two devices, also known as RS-232 and V.24.

EIA-422
: ANSI/TIA/EIA-422 standard for serial transmission of data between two devices, also known as RS-422 and V.11.

EIA-485
: ANSI/TIA/EIA-485 standard for serial transmission of data between multiple devices, also known as RS-485.

EIA-574
: Standard for the pinout of serial D-sub connectors.

EMC
: Electromagnetic compatibility

EMI
: Electromagnetic interference

ESD
: Electrostatic discharge. ESD can damage electronic equipment.

Ethernet
: The standard for local area networks developed jointly by Digital Equipment Corp., Xerox, and Intel. Ethernet is used as the underlying transport vehicle by several upper-level protocols, including TCP/IP.

Gateway
: A network device that passes data between different networks or fieldbusses.

Gateway address
: The IP address of the gateway or router used to access the Internet from the local are network.

IEEE
: Institute of Electrical and Electronics Engineers

IP
: Ingress Protection Rating standardized in IEC 60529. Standard for various grades of electrical enclosures.

IP address
: A numeric address used by computer hosts to transmit and receive information over the Internet.

ISO
: International Standards Organisation

MAC address
: Every piece of Ethernet hardware has a unique number assigned to it called it's MAC address. MAC addresses are administered and assigned by the IEEE organization.

Modbus
: Fieldbus protocol used in the process automation industry. It uses a master and slave structure. Originally developed by Modicon, now part of Schneider Automation.

NEMA
: National Electrical Manufacturers Association. NEMA defines standards for various grades of electrical enclosures.

Node
: A communications device on the network.

PC/ABS
: Polycarbonate-ABS. Widely used thermoplastic material.

PLC
: Programmable Logic Controller

RS-232
: See *EIA-232*.

RS-422
: See *EIA-422*.

RS-485
: See *EIA-485*.

Subnet mask
: A numeric address used in conjunction with an IP address to segment network traffic; used to restrict transmissions to certain subnets.

Switch
: A device that facilitates transmissions between nodes in a star-formed network.

TCP/IP
: Transport Control Protocol/Internet Protocol. Connection-orientated transfer protocol.

Telnet
: A network protocol (RFC 854) for character based terminal access to remote machines.

UL 94
: Plastics flammability standard released by Underwriters Laboratories of the USA.

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References

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Version:	1.0, October 2010
Software-Version:	1.6
Model:	*SL-MOD-GW*
Description:	Modbus/TCP Gateway
Document Type:	User manual
IP-Address:	192.168.1.130
WebSite:	www.weidmuller.com.au
Warenzeichen1:	Ethernet is a trademark of Xerox Corporation.
Warenzeichen2:	Weidmller® is a registered trademark of Weidmller Interface GmbH & Co. KG